



Bladder and Bowel Symptoms Among Adults Presenting With Low Back Pain to an Academic Chiropractic Clinic: Results of a Preliminary Study



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Abstract

Objective: The purposes of this study were to estimate the 1-month point prevalence of bowel and bladder symptoms (BBS) among adult chiropractic patients and to evaluate associations between these symptoms and low back pain (LBP).

Methods: Patients 18 years or older presenting to a chiropractic college academic health clinic between March 25 and April 25, 2013, were asked to complete a symptom screening questionnaire. Descriptive statistics, binary logistic regression, Fisher exact test, and *P* values were calculated from the sample.

Results: The sample included 140 of 1300 patients who visited the clinic during the survey period (11%). Mean age was 47.5 (range 18–79) years. LBP was the primary chief complaint in 42%. The 1-month point prevalence of any bladder symptoms was 75%, while the rate for bowel symptoms was 62%; 55% reported both BBS. Binary logistic regression analyses showed no statistically significant association between a chief complaint of LBP and combined BBS (OR = 1.67, *P* = .164).

Conclusion: The prevalence of bowel and bladder symptoms in chiropractic patients was high. There was no statistically significant association between these symptoms and LBP in this group of patients seeking care for LBP.

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Introduction

The prevalence rates of low back pain (LBP)¹ as well as bladder^{2,3} and bowel dysfunction⁴ in adult populations are well documented in the literature. LBP is the 5th most common reason for physician visits in the

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United States, with an annual point prevalence of approximately 25%.⁵ LBP is also the most common condition treated by doctors of chiropractic. Bladder dysfunction consists of symptoms such as urinary incontinence (urge, stress, overflow, mixed, or functional),⁶ dysuria, recurrent urinary tract infections (UTIs), hesitancy, nocturia, urgency, and/or frequency.⁷ Urinary incontinence affects nearly 200 million people worldwide,⁸ while UTIs account for nearly 7 million office visits and 1 million emergency department visits annually.⁹ Bowel dysfunction involves symptoms including incontinence, constipation, diarrhea, and hemorrhoids.¹⁰ The prevalence of fecal incontinence and constipation varies from 1-20% of the general adult population depending which definitions are applied.¹¹ Combined fecal and urinary incontinences occur in 10% of both men and women.¹² While most bladder and bowel symptoms are more prevalent in women than men, people of both genders and across all age groups suffer from symptoms of concurrent bladder and bowel dysfunction.^{2,13}

While physicians routinely assess recent changes in bladder and bowel symptoms during diagnosis of people with LBP,¹⁴ no data exist describing the prevalence of these symptoms in adults seeking treatment in chiropractic clinical settings. Bladder and bowel dysfunction may be more prevalent than LBP in some populations yet, due to the stigmatizing nature of these symptoms, providers may be unaware that their patients are struggling with these conditions.^{10,15} Research estimates between 50% and 67% of people with incontinence do not report the problem to healthcare personnel.¹⁶ Healthcare providers who underestimate the prevalence of bladder and bowel symptoms in their patients may not initiate discussion about these symptoms with their patients leading to improper diagnosis, treatment, or referral for these conditions.

According to the 2008 National Health and Nutrition Examination Survey, 49.6% of women¹⁷ and nearly 16% of men¹⁸ over the age of 20 reported urinary incontinence. One in 3 women experience a UTI by age 24 and according to the 1997 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey, nearly 18 million U.S. adults (about 1 in 12) experience fecal incontinence.¹⁹ In the worldwide general population the prevalence of constipation ranges from 0.7% to 79% (median 16%) with confounding factors including female gender, increasing age, socioeconomic status and education level.²⁰ One study reported that 1 in 5 adult women chosen from a community-based research database suffers from fecal incontinence²¹; estimates that are

more conservative range from 6-15%.¹² The same study reported fecal incontinence occurring in 6-10% and increases slightly with age.¹²

An association may exist between low back pain and sacral plexus autonomic function though the precise mechanisms underlying urinary incontinence and its related physical symptoms are unknown.^{22,23} Evidence from clinical and epidemiological studies supports a possible association between LBP and bowel^{24,25} and bladder dysfunction.^{26,27} Thus, the nociceptive and visceral neural pathways of the sacral plexus and their ability to optimally function are clinically relevant when evaluating patients with chronic low back pain.^{26,27} Much of this research describes the occurrence of these symptoms in women of child-bearing age,²⁸⁻³⁰ as side effects of opioids,³¹ or severe conditions such as cancer,³² cauda equina syndrome³³ and neurological diseases such as multiple sclerosis.³⁴ Little is known about the relationship between LBP and bowel and bladder dysfunction in male and older adult subpopulations. Several case reports or case series have reported on the treatment of bladder or bowel symptoms in chiropractic patients, with many of these studies focusing on infants and children.³⁵⁻⁴¹ Few studies have evaluated the prevalence or association of bladder or bowel symptoms and LBP in adult patients seeking manual therapies, including chiropractic.^{28,42-46}

The purposes of this preliminary study are to report the results of a survey designed to: (1) estimate the 1-month point prevalence of bowel and bladder symptoms among adult patients seeking care at an academic chiropractic clinic, and (2) determine whether there is an association between symptoms of bladder and bowel dysfunction and low back pain in this patient population. We hypothesize that the prevalence of bowel and bladder dysfunction will be high in chiropractic patients and that the patients who report low back pain as the main reason for their visit will have a higher prevalence of bowel and bladder symptoms than patients who were seeking treatments for other areas of chief complaint.

Methods

The institutional review board at Palmer College of Chiropractic, Davenport, IA, approved the human participant protections for this study. All participants were provided informed consent and information regarding the voluntary nature of survey participation.

Study Group

The inclusion criteria were chiropractic patients currently seeking care at the college's chiropractic clinic ages 18 years or older, with the ability to understand and read the English language and willingness to participate in the Continence Screening Self-Reported Questionnaire.

The college's clinic administration agreed to participate in conducting this survey. Participation included distribution of a written cover letter providing information on the study and questionnaire to be handed out to the chiropractic patients who met the inclusion criteria. Men and women seeking chiropractic care between March 25 and April 25, 2013, who agreed to participate and who answered the questionnaire were included in the study. The front desk staff at the chiropractic clinic were asked to write patient IDs and dates on the form and collect the forms from patients who declined participation. Researchers had no link between survey participants' name and patient ID to assure anonymity. The cover letter described the purposes of the study, the voluntary and anonymous nature of participation, confidentiality procedures used for the survey management, and that patients could decline participation without any effect on their chiropractic treatment and care. The completed questionnaire was put into an envelope, which was sealed by the patient, and placed into a locked drop-box at the front desk.

Questionnaire

A modified questionnaire, the Continence Screening Questionnaire (CSQ), was created from the International Consultation on Incontinence Questionnaires (ICIQs) for both bowel and bladder.^{47–49} The ICIQs assess symptoms and impact of incontinence across the population and were created to be widely applicable for use in clinical practice and research. The ICIQs assess the prevalence, frequency, and perceived cause of incontinence and its impact on everyday life. Also, the ICIQs have high levels of validity, reliability, and sensitivity evaluated according to standard psychometric methods.⁴⁹ These instruments perform well in individuals of varying ages, genders, patient groups, settings, and diagnoses.^{50–55} Responses to questions are presented in a variety of forms, including fill-in-the-blank and categorical multiple choice. For this study, we modified the ICIQs into a shortened version, the CSQ, to decrease the length of administration time and also included questions on low back pain to focus on the following 5

domains of interest. Domain 1 is a single question that determined the primary reason the participant was seeking chiropractic care and was to identify the participant's chief complaint. Domain 2 consists of 2 questions regarding low back pain designed to detect the presence, average severity of LBP over the past 4 weeks, and overall duration of LBP. Severity of LBP was assessed using an 11-point Numerical Rating Scale (NRS) where "0" indicates "Not at all Painful" and "10" indicates "Extremely Painful." Duration of LBP was evaluated using a 6-point ordinal categorical scale.⁵⁶ To detect the absence of LBP there was an option in question number 2 to indicate "Not applicable-I do not have LBP." Domain 3 of the CSQ gathers demographic information including gender and self-reported height, weight, and age. The self-reported weight and height was used to calculate body mass index (BMI) scores. Domain 4 consists of 14 questions to evaluate bladder habits, bladder continence, and bladder continence-related quality of life (QOL). And finally, domain 5 consists of 10 questions to evaluate bowel habits, bowel continence, and bowel continence-related QOL. The overall time commitment for completing the survey was approximately 8 minutes.

Data Analyses

Low back pain was categorized as a positive response if the participant marked "Low Back Pain" as the main reason for their visit, if their NRS score was a 2 or higher for LBP, or if they reported LBP of any duration (<1 week to >5 years).

Bladder dysfunction was categorized as having a positive response to any of the following 6 questions: (1) "Do you feel a sudden urge to urinate?" (2) "Do you have a weak stream or need a long time to urinate?" (3) "Do you urinate in a start and stop manner?" (4) "Do you strain yourself when you urinate?" (5) "Do you feel there is residual urine after urination?" and (6) "How often do you leak urine?"

Bowel dysfunction was categorized as having a positive response to any of the following 4 questions: (1) "Do you need to strain to have a bowel movement?" (2) "Do you have diarrhea?" (3) "Do you have constipation?" and (4) "Do you experience any staining of your underwear or need to wear pads because of your bowels?"

Overweight was categorized as a BMI ≥ 25 kg/m² while obese was categorized as ≥ 30 kg/m².⁵⁷

Age classifications were broken down into 5 broad population groups - young adult (18-24 years), middle

adulthood (25-44 years), older adulthood (45-64 years), retirement (65-84 years), and older elderly (85+ years).

Statistical Analysis

Data were analyzed using SPSS 18.0 (SPSS, Chicago, IL). Descriptive statistics evaluated the first hypothesis regarding the prevalence of bowel, bladder, combined bowel and bladder dysfunction and low back pain then reported as percentages and means. Sample-based estimates of the odds ratio were used to evaluate data pertaining to our second hypothesis to determine the probability of bowel and/or bladder dysfunction in those *with* versus those *without* a chief complaint of low back pain were calculated using binary logistic regression. Fisher's exact probability test was used to test the hypotheses.

Results

Demographics of Survey Participants

There were a total of 1300 potentially eligible patients during the study period and of those a total of 140 (11%) answered the questionnaire. There were 59 males and 79 females (gender data were missing on 2 participants) with a mean age of 47.5 (range 18-79) years. Body mass index averaged 30 kg/m² (range 19-50 kg/m²). Thirty-four percent of the respondents were overweight and 44% were obese (Table 1). The majority of patients reported LBP as the main reason for their visit (42%). Eight-five percent reported having "some" duration of LBP (Table 2).

Prevalence of Bladder and Bowel Symptoms (shown in Tables 3-5)

Bladder Symptoms

Forty-three percent of the women and 32% of the men reported bladder symptoms (Table 3). The most frequently reported bladder symptoms were "Feel a sudden urge to urinate" (56%) and "Feel there is residual urine after urination" (41%). Twenty-six percent of the chiropractic patients reported a frequency of urinary leakage of at least once a week or less. The most frequently reported urinary leakage occurrences were "Before I can get to the toilet" (14%) suggesting urge UI and "When I cough or sneeze" 14% suggesting stress UI (Table 4). Nine percent of the chiropractic patients reported use of pads, napkins, tissues,

Table 1 Demographics Self-Reported Basic Demographic Information of Chiropractic Patients

Demographic Information	Survey Respondents (n = 140) ^a	Eligible AHC Patients (n = 1300)
Gender, n (%)		
Male	59 (42)	N/A
Female	79 (56)	
Age, mean (SD), range	47.5 (16), 18-79	45.1, 18-90
Age Categories		
Young Adult (18-24)	6 (6)	100 (8)
Middle Adulthood (25-44)	55 (10)	554 (43)
Older Adulthood (45-64)	56 (12)	477 (37)
Retirement (65-84)	22 (14)	162 (12)
Older Elderly (85+)	0 (0)	7 (1)
BMI (Median IQR)		
Healthy weight (18.5-24.9)	30 (22)	N/A
Overweight (25-29.9)	46 (34)	
Moderately obese (30-34.9)	33 (24)	
Severely obese (35-39.9)	19 (14)	
Very severely obese (>40)	8 (6)	

AHC, Academic Health Center; BMI, body mass index; IQR, interquartile range; N/A, not applicable.

^a Missing data if total n is not equal to 140.

towels, or other incontinence aids at least "sometimes." Responses to the interference of bladder symptoms on everyday life and bladder accident bothersomeness questions were extremely low (mean = 0.8 [range, 0-8] and mean = 1.5 [range, 0-10], respectively).

Bowel Symptoms

Forty percent of the women and 23% of the men reported bowel symptoms (Table 5). Thirty percent of the chiropractic patients reported a frequency of

Table 2 Reason for Visit and Low Back Information Self-Reported Area of Chief Complaint and Severity and Duration of Low Back Pain (n = 140)^a

Reason for Visit, n (%) ^b		Low Back Information	
Headaches	21 (15)	Low Back Pain NRS, mean (SD), range	3.6 (2), 0-9
Neck	42 (30)	Duration of LBP, n (%)	134 (95)
Mid-back	30 (21)	Not applicable	15 (11)
Lower back	59 (42)	< 1 week	12 (9)
Hip(s)	20 (14)	1 to 5 weeks	17 (12)
Osteoarthritis	1 (1)	6 weeks to < 1 year	10 (7)
Fibromyalgia	2 (1)	1 to 5 years	34 (24)
Other	34 (24)	> 5 years	46 (33)

LBP, low back pain; NRS, numerical rating scale.

^a Missing data if total n is not equal to 140.

^b Survey participants selected more than one condition as their "Main reason for visiting the chiropractor" therefore n > 140.

Table 3 Bladder SymptomsSelf-Reported Responses to *Domain 4*, Bladder Symptoms, of the Continence Screening Questionnaire (n = 140)^a

Bladder Symptom Frequency Questions	Gender	Never or Rarely	Occasionally “More Than Once a Month”	Sometimes “More Than Once a Week”	Always “More Than Once a Day”	Had Any Symptom
Bladder Questions	n	n (%)	n (%)	n (%)	n (%)	n (%)
Do you feel a sudden urge to urinate?, n (%)	Male, 59 Female, 78 Total, 137	26 (44) 34 (44) 60 (44)	21 (36) 27 (35) 48 (35)	8 (14) 14 (18) 22 (16)	4 (7) 3 (4) 7 (5)	33 (56) 44 (56) 77 (56)
Do you have a weak stream or need a long time to urinate?, n (%)	Male, 59 Female, 78 Total, 137	36 (61) 54 (69) 90 (66)	13 (22) 17 (22) 30 (22)	8 (14) 7 (9) 15 (11)	2 (3) - 2 (1)	23 (39) 24 (31) 47 (34)
Do you urinate in a start and stop manner?, n (%)	Male, 58 Female, 77 Total, 135	35 (60) 47 (61) 82 (61)	12 (21) 18 (23) 30 (22)	5 (9) 4 (5) 9 (7)	6 (10) 8 (10) 14 (10)	23 (40) 30 (39) 53 (39)
Do you strain yourself when you urinate?, n (%)	Male, 59 Female, 78 Total, 137	50 (85) 77 (99) 127 (93)	6 (10) 1 (1) 7 (5)	2 (3) - 2 (1)	1 (2) - 1 (1)	9 (15) 1 (1) 10 (7)
Do you feel there is residual urine after urination?, n (%)	Male, 58 Female, 77 Total, 135	34 (59) 46 (60) 80 (59)	16 (28) 18 (23) 34 (25)	5 (9) 11 (14) 16 (12)	3 (5) 2 (3) 5 (4)	24 (41) 31 (40) 55 (41)

^a Missing data if total n is not equal to 140.

bowel symptoms of at least 1 month in duration. The most frequently reported bowel symptoms were “Need to strain to have a bowel movement” (44%) and “Have constipation” (42%). Responses to the interference of bowel symptoms on everyday life and bowel accident bothersomeness questions were extremely low (mean = 0.7 [range 0-10] and mean = 1.3 [range 0-10], respectively).

Evaluation of an Association

Odds ratios and prevalence rates with respect to bladder and bowel symptoms for chiropractic patients with a chief complaint of LBP are presented in [Table 6](#).

Thirty-two percent of chiropractic patients with LBP did not have any bowel or bladder symptoms and 27% with LBP had combined bowel and bladder dysfunction. Chiropractic patients with *no* LBP reported a higher prevalence of bladder, bowel, and combined bladder and bowel symptoms versus those *with* LBP ([Table 6](#)). However, those *with* LBP were more likely to report bowel and bladder symptoms than *no* bowel or bladder symptoms ([Table 6](#)). Binary logistic regression analyses revealed that the associations between bladder, bowel, and combined bladder and bowel dysfunction and LBP (OR = 1.09 [$P = .845$], OR = 1.55 [$P = .282$], and OR = 1.67 [$P = .164$]

Table 4 Urinary LeakageSelf-reported responses to *Domain 4*, Bladder Symptoms, of the Continence Screening Questionnaire (n = 140)^a

Frequency of Urine Leakage, n (%)	Urine Leakage Causes, n (%) ^b
Never	100 (71)
Once a week or less	20 (14)
2-3 times a week	7 (5)
About once a day	7 (5)
Several times a day	1 (1)
Leak urine constantly	1 (1)
Amount of Urine Leakage, n (%)	
Small amount	36 (26)
Moderate amount	4 (3)
Large amount	-

^a Missing data if total n is not equal to 140.^b Survey participants were asked to mark all that apply therefore n > 140.

Table 5 Bowel SymptomsSelf-reported responses to *Domain 5*, Bowel Symptoms, of the Continence Screening Questionnaire (n = 140)^a

Bowel Symptom Frequency Questions	Gender	Never or Rarely	Occasionally “More Than Once a Month”	Sometimes “More Than Once a Week”	Always “More Than Once a Day”	Had Any Symptom
Bowel Questions	n	n (%)	n (%)	n (%)	n (%)	n (%)
Do you need to strain to have a bowel movement?, n (%)	Male, 57 Female, 77 Total, 134	39 (68) 36 (47) 75 (56)	12 (21) 32 (42) 44 (33)	5 (9) 7 (9) 12 (9)	1 (2) 2 (3) 3 (2)	18 (32) 41 (53) 59 (44)
Do you have diarrhea?, n (%)	Male, 56 Female, 76 Total, 132	45 (80) 44 (58) 89 (67)	7 (16) 25 (57) 32 (24)	4 (9) 5 (11) 9 (7)	- 2 (3) 2 (2)	11 (20) 32 (42) 43 (33)
Do you have constipation?, n (%)	Male, 56 Female, 76 Total, 132	40 (71) 37 (49) 77 (58)	9 (16) 29 (38) 38 (29)	6 (11) 8 (11) 14 (11)	1 (2) 2 (3) 3 (2)	16 (29) 39 (51) 55 (42)
Do you use medications (tablets or liquids) to start or stop bowel movements?, n (%)	Male, 57 Female, 77 Total, 134	50 (88) 65 (84) 115 (86)	4 (7) 5 (6) 9 (7)	2 (4) 3 (4) 5 (4)	1 (2) 4 (5) 5 (4)	7 (12) 12 (16) 19 (14)
Do you experience any staining of your underwear or need to wear pads because of your bowels?, n (%)	Male, 57 Female, 76 Total, 133	57 (100) 73 (96) 130 (98)	- 2 (2) 2 (2)	- 1 (1) 1 (1)	- - -	- 3 (4) 3 (2)

^a Missing data if total n is not equal to 140.

respectively) were not statistically significant. Although statistically insignificant it may be of clinical relevance that the chiropractic patients who reported LBP as the main reason for visiting Palmer's AHC between March 25th and April 25th were 1.67 times more likely to self-report having combined bladder and bowel symptoms than patients without LBP (OR = 1.67 [$P = .164$]). However, based on the results from this sample population, no statistically significant association was found between LBP and bowel and bladder dysfunction was found.

Discussion

To our knowledge, there have been no studies that have attempted to evaluate the point prevalence of bowel and bladder symptoms and if there is an association between these symptoms and low back pain in a chiropractic patient population. Our study helped to address this information gap. There are cross-sectional studies conducted within physical therapy clinics evaluating the occurrence of urinary incontinence in women with LBP using a self-reported questionnaire²⁸ but no studies conducted in chiropractic clinics evaluating both men and women. The present study is a first attempt to describe the prevalence rates of bladder and bowel symptoms in adult chiropractic patients and

evaluate whether chiropractic patients with a chief complaint of LBP suffer from bladder and bowel dysfunction more or less, or the same as patients with other areas of chief complaints. Also, because there is an association between LBP and symptoms of bowel and bladder dysfunction according to studies conducted in women of childbearing age,^{28,58} we evaluated the possible association in both men and women of various ages.

We hypothesized a high prevalence of bladder and/or bowel dysfunction due to the high prevalence of LBP in chiropractic patients (42%) and the known possible associations between LBP and bowel and bladder dysfunction. However, although prevalence rates were high in our survey respondents, there was *not* a higher prevalence of bowel and bladder symptoms in patients seeking treatment for LBP than for other areas of chief complaint (Table 2). Furthermore, based on analyses of binary logistic regression, estimates of associations between LBP and bowel and/or bladder symptoms were low and statistically insignificant (OR = 1.67, $P = .164$).

Studies have suggested that lumbar spondylosis and chronic degenerative spinal disease²² may be the major cause of chronic urinary symptoms,^{26,59} whereas others suggest a relationship of UI due to the instability of pelvic floor muscles and the myofascial connection with the surrounding pelvic organs.³⁸ In any case, future studies should focus on the development of

Table 6 Associations Between Bladder and Bowel Symptoms and Low Back Pain (n = 140) ^a

Associations Between Bladder and Bowel Dysfunction and Low Back Pain		No	Yes	Odds Ratio	Fisher's Exact Test	
					CI	P
No bladder or bowel symptoms	(n = 140)	106 (75)	34 (24)	0.92	(0.42, 2.01)	.845
With LBP	(n = 138)	45 (32)	14 (10)			
No LBP		59 (43)	20 (14)			
Any bladder symptoms	(n = 140)	34 (24)	106 (75)	1.09	(0.50, 2.39)	.845
With LBP	(n = 138)	14 (10)	45 (33)			
No LBP		20 (14)	59 (43)			
Any bowel symptoms	(n = 138)	51 (36)	87 (62)	1.55	(0.76, 3.16)	.282
With LBP	(n = 136)	18 (13)	40 (29)			
No LBP		32 (24)	46 (34)			
Both bladder and bowel symptoms	(n = 138)	60 (43)	78 (55)	1.67	(0.83, 3.36)	.164
With LBP	(n = 136)	21 (15)	37 (27)			
No LBP		38 (28)	40 (29)			

CI, confidence interval; LBP, low back pain.

^a Missing data if total n is not equal to 140.

therapeutic strategies to manage UI. However, a review of the literature regarding management of UI revealed that both conservative musculoskeletal interventions such as spinal manipulation/chiropractic care and pelvic floor exercises and surgical interventions work and treatment preference depends on which mechanism is considered to be underlying cause of UI.^{27,28,40,60,61}

According to a national chiropractic practice analysis survey, doctors of chiropractic report that they *rarely* or *virtually never* see patients with concurrent urological or gastrointestinal conditions such as incontinence.⁶² When patients *do* present with bladder or bowel symptoms, however, nearly 40% of chiropractors do not provide any specific treatment and only 49% refer patients to other providers.⁶² Our study results suggest that symptoms of bowel and bladder dysfunction, either individually or in combination, is much more prevalent in both men and women visiting the chiropractor than what doctors of chiropractic are reporting.⁶² One possible explanation may be that in the mind of a practitioner, incontinence is related with more severe conditions such as cauda equina syndrome rather than in the context of dribbling urine when coughing or sneezing.

According to a case-series of 21 patients conducted by Cuthbert et al,⁶³ chiropractic treatment involving high-velocity low-amplitude spinal manipulation, Cox flexion distraction manipulation, and/or percussion instrument assisted myofascial trigger point treatments improved or resolved UI symptoms and outcomes remained stable over a 2-year follow-up period.⁶³ A systematic review of clinical outcomes following osteopathic intervention for lower urinary tract symptoms in women show promise.⁶⁴ In surgical therapies where spinal conditions were considered the underlying causes of UI,

spinal cord stimulation and decompressive laminectomy were used to effectively treat urinary symptoms.^{22,65}

Limitations

A limitation in this study included the feasibility issues associated with conducting the survey using non-research personnel. It is difficult to gauge bias due to refusal to participate versus busy clinic staff failing to recruit. The use of clinic staff as our survey implementation strategy had an impact on coverage and non-response error. For example, it appears that older adults more often completed the survey versus other eligible survey participants (Table 1). Also, with a response rate of only 140 out of 1300 potentially eligible respondents (11%), we may have failed to adequately cover all components of the population being studied, making it difficult to externally generalize our results. We were unable to precisely measure a true response rate for this survey instrument due to the inconsistencies of clinic staff collecting survey refusals further increasing coverage and non-response error. Furthermore, there may be differences in the people who responded compared to those who did not.

Another limitation was the use of self-reported data. Survey participants did not receive a clinical exam evaluating possible comorbidities associated with their bowel and bladder symptoms therefore we cannot draw any specific conclusions as to possible spinal causes in relation to their symptoms. For example, a urinary symptom related to benign prostatic hypertrophy includes urinating in a start-and-stop manner.⁶⁶ It could then be argued that the urinary symptoms were caused by the benign prostatic hypertrophy and the

presence of LBP was coincidental and unrelated. Similarly, we did not ascertain women's obstetric and gynecological symptoms which are a leading cause of stress incontinence.³⁰ Perhaps future study designs could include data collection and statistical analyses to compare a cohort of chiropractic patients with similar characteristics to a study conducted of 200 women with LBP presenting to physical therapy clinics. The results of Eliasson et al showed that LBP was a risk factor for urinary incontinence in women, regardless of their parity status, with 78% of the women with LBP also reporting UI.²⁸

Although UI correlates positively with LBP, our results of associations between LBP with bladder (OR = 1.09, $P = .845$), bowel (OR = 1.55, $P = .282$), and combined bowel and bladder dysfunction (OR = 1.67, $P = .164$) were small and statistically insignificant (Table 6). The low threshold of "pain" for which we defined having the presence of LBP (2 or above on the NRS pain scale) may have affected our failure to confirm our hypothesis that an association exists. The self-reported mean NRS pain score of our study sample was 3.6 (SD = 2, Range 0-9). Had we evaluated patients with a severity of LBP of 5 or above on the pain NRS our outcomes may have been different.

Despite these limitations, LBP, bowel, and bladder symptoms were found to be prevalent in adult chiropractic patients and the associations between these symptoms may be even greater in a more representative chiropractic study sample. The strength of this study was the evaluation of LBP as well as bladder and bowel dysfunction in a previously unreported study sample, adult men and women seeking chiropractic healthcare.

Conclusion

The 1-month point prevalence of bladder and bowel dysfunction in adult chiropractic patients was high, 75% and 63% respectively yet there was no statistically significant association between LBP and combined bowel and bladder dysfunction (OR = 1.67, $P = .164$) in this study population. Due to the high prevalence of these conditions, doctors of chiropractic may consider screening patients for bladder and bowel symptoms to improve clinical management such as offering self-care advice, comanaging, or referring to other health care providers as indicated.

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